

WebKit

Portable, Embeddable WebEngine in comparsion



Holger Hans Peter Freyther

European Embedded Linux Conference 2007

<http://www.openembedded.org/~zecke/elce2007>

About me

Workaholic?

- Holger Freyther (zecke@selfish.org)
- Involved with Linux on handhelds since 2000, starting with the Agenda Vr3, Sharp Zaurus, Compaq iPAQ.
- Google Summer of Code Student in 2007, working on WebKit/Gtk+ with OpenMoko as mentoring organization.
- Working for GMIT GmbH on DVB-H (freyther@gmit-gmbh.de)
- Sponsored by Trolltech to work on OpenEmbedded (holger.freyther@trolltech.com)

Agenda

- WebKit project - Goals and Mission
- WebKit ports to Wx, Gtk+ and Qt
- Mozilla/Gecko/Firefox/Minimo?
- Measuring and Benchmarking
- WebKit optimized for Qtopia Core
- Conclusions

What are we going to do now?

Finding out why WebKit rocks

- The Web is getting more important
- The Web is getting more complex
- We have broadband everywhere
- We need good browser engines
- We need to embed internet technology into our products/applications

WebKit Project

Goals and Mission

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine
- Compatibility

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine
- Compatibility
- Stability

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine
- Compatibility
- Stability
- Security

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WebKit Project

Goals and Mission

- Web Content Engine
- Compatibility
- Stability
- Security
- Usability

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine
- Open Source
- Compatibility
- Stability
- Security
- Usability

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine
- Compatibility
- Stability
- Security
- Usability
- Open Source
- Standards Compliance

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine
- Compatibility
- Stability
- Security
- Usability
- Open Source
- Standards Compliance
- Performance

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine
- Compatibility
- Stability
- Security
- Usability
- Open Source
- Standards Compliance
- Performance
- Portability

<http://webkit.org/projects/goals.html>

WebKit Project

Goals and Mission

- Web Content Engine
- Compatibility
- Stability
- Security
- Usability
- Open Source
- Standards Compliance
- Performance
- Portability
- Hackability

<http://webkit.org/projects/goals.html>

WebKit Project

In other words

- We care for Performance (Speed + RAM)
- We are the fastest!
- Every change gets reviewed
- Support for SVG, HTML5, CSS3, XML...
- We want people to use WebKit

The WebKit ports

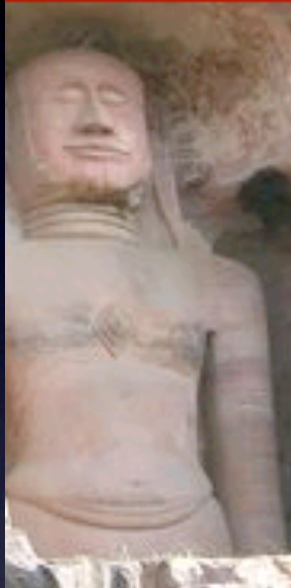
The official ones

- WebKit using Wx
- WebKit using Gtk+
- WebKit using Qt

OpenMoko Browser, Sugar WebKit Activity, QtLauncher, Iris Browser



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The INQ in Bulgaria is a dangerous place

Apple fan boys roam the streets

By [Nick Farrell](#): Wednesday, 17 October 2007, 2:10 PM

THE INQ'S Bulgarian office in Sofia is probably not in the safest work location in Europe.

According to *Reporters without Borders*, Bulgaria is ranked a pitiful 51st in its [world league tables](#) for nice places for hacks to work.

The best is Iceland although we wouldn't imagine you would get many good stories and the worst is Eritrea.



BrowseKit Activity

Share with: Private



Activity

Browse

1



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The OLPC Wiki

(Redirected from [Home](#))This page is maintained by the OLPC team. Please use the **discussion tab** for your comments.[deutsch](#) | [english](#) | [español](#) | [français](#) | [italiano](#) | [日本語](#) | [한국어](#) | [монгол](#) | [português](#) | [română](#) | [русский](#)

HowTo [ID# 56624] +/-

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Welcome to the OLPC Wiki, home to collaborative notes about the One Laptop per Child project and related projects and communities. We currently have 3,760 pages and roughly two-thousand registered contributors; please join us and share your ideas. There is also a non-wiki [laptop.org](#).

[Submit new content](#)

What's new

- [Intel](#) joins OLPC as its newest member.
- **B4** machines are being distributed to developers who have joined the [Developers Program](#). Those without machines can still run [emulators](#) on their current computers. [Test Group Release Notes](#) are being updated daily. Also, visit the [Activities](#) page to see the latest on activity developments.
- We have a new skin for this wiki; thanks to [Simon Dorner](#) and the crew from OLPC Austria (you can change skins via [Special:Preferences](#) after you log in).
- Add an [OLPC badge](#) to your website.
- A report from OLPC in Nigeria: School [Galadima](#)
- OLPC wins the [Bridging Nations](#) Bridge Builder Award: Technological Innovation for Bridging Digital Divide.
- New milestone: working autonomous mesh operation while the XO is suspended.
- Latest release: The new stable build, [Build 406](#), and a new firmware release, [Q2C18](#), are available. Please update your machines. The [autoreinstallation image](#) makes this easy; you'll find many improvements in virtually all system functions ([Release notes](#)). Directions for [Customizing NAND images](#) have been added to the [wiki](#).
- Localization: The Spanish translation of [www.laptop.org](#) is now on line, thanks to the tireless efforts of [Xavier Alvarez](#). The templates for adding additional languages can be found at [Localization/www.laptop.org](#). The [Simplified Chinese translation](#) is also on line, thanks to [Scott Zhu](#); as is the [Portuguese translation](#), thanks to [Paulo Drummond](#); and the [Korean translation](#), thanks to [Do Young-Min](#).

Latest Releases: OS images

Stable: [Build 406.15](#) (2007-06-19)Firmware: [Q2C18](#) (2007-06-14)[how to update...](#) +/-
[known bugs?](#) [does it work for you?](#)Weekly updates can be found in [Current events](#).

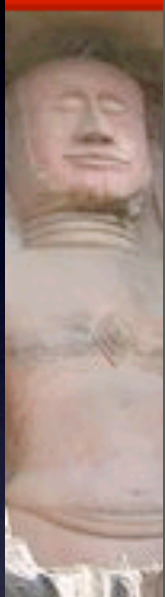
About One Laptop per Child

*It's an education project, not a laptop project.*— [Nicholas Negroponte](#)

Browser

18:19

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NEWS



SOFTWARE
ORY



BrowseKit Activity

Share with: Private

Activity

Browse

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www.openmoko.org

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CELF - Embedded Linux Conference

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http://www.celinux.org/elc_europe07/elc_europe_index.h

CELF Embedded Linux Conference Europe November 2 & 3, 2007



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Venue

Sessions

Program

Hotels

News

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The CELF Embedded Linux Conference - Europe 2007

Register Here

Location: Linz, Austria

Dates: November 2 and 3 (Friday, Saturday), 2007

Venue: Johannes Kepler University

Times: 9:00 am to 7:00 pm

Price: Students 16 Euro; Private 64 Euro; Company 256 Euro (tentative)

ELC-Europe 2007 (ELC-E) is a joint conference with the [9th Real-Time Linux Workshop \(RTLWS\)](#) that is organized by the Real Time Linux Foundation.

Conference Highlights



OpenMoko Browser, Sugar WebKit Activity, QtLauncher, Iris Browser

Browser

18:19

BrowseKit Activity

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Activity

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CELF - Embedded Linux Conference

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http://www.celinux.org/elc_europe07/elc_europe_index.h

CELF Embedded Linux Conference
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13:02

Gmail - Gmail is different. Here's what you need to know.

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Search Mail Search the Web Show search optio

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Archive

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Delete

More Actions...

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Gmail is different. Here's what you need to know. [Inbox](#)

★ Gmail Team <mail-noreply@google.com>

Tue, Oct 30, 2007 at 11:56 AM

To: Matthew Staikos <irisbrowser@gmail.com>

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Messages that are easy to find, an inbox that organizes itself, great spam-fighting tools and built-in chat. Sound cool? Welcome to Gmail.

OpenMoko Browser, Sugar WebKit Activity, QtLauncher, Iris Browser

WebKit/Wx

Overview and dependencies

Status

- One active developer
- Development in a branch to avoid the review process

Dependencies

- wxWidgets
- CURL for networking
- libxml2 for XML handling

WebKit/Gtk+

Overview and dependencies

Status

- Committer and Reviewers available
- Industry interest
- OpenMoko and various GNOME application adopted it
- No stable API yet

Dependencies

- Gtk+ (Gdk, Pango, Cairo) version 2.6 works
- CURL for networking
- libxml2 for XML handling
- ICU for unicode handling

WebKit/Qt

Overview and dependencies

Status

- Committer and Reviewers available
- It will be part of Qt4.4 for all platforms with stable API
- The commercial Iris Browser is available
- Consulting is available as well

Dependencies

- QtCore, QtGui, QtXml, QtNetwork

Mozilla/Gecko/Firefox

Overview and dependencies

Status

- Mature and widely used
- Sort of Stable but not complete API
- Linux and non-x86 systems are 2nd class citizens
- Mozilla Manifesto

Dependencies

- Gtk+ (Gdk, Pango, Cairo), X11

The Competition

Measuring and Benchmarking

- Use WebKit/Gtk+, WebKit/Qt and Minimo
- Determine/Measure the installed size
- Open about:blank, a Foto Log and determine the memory footprint usage.

The Process

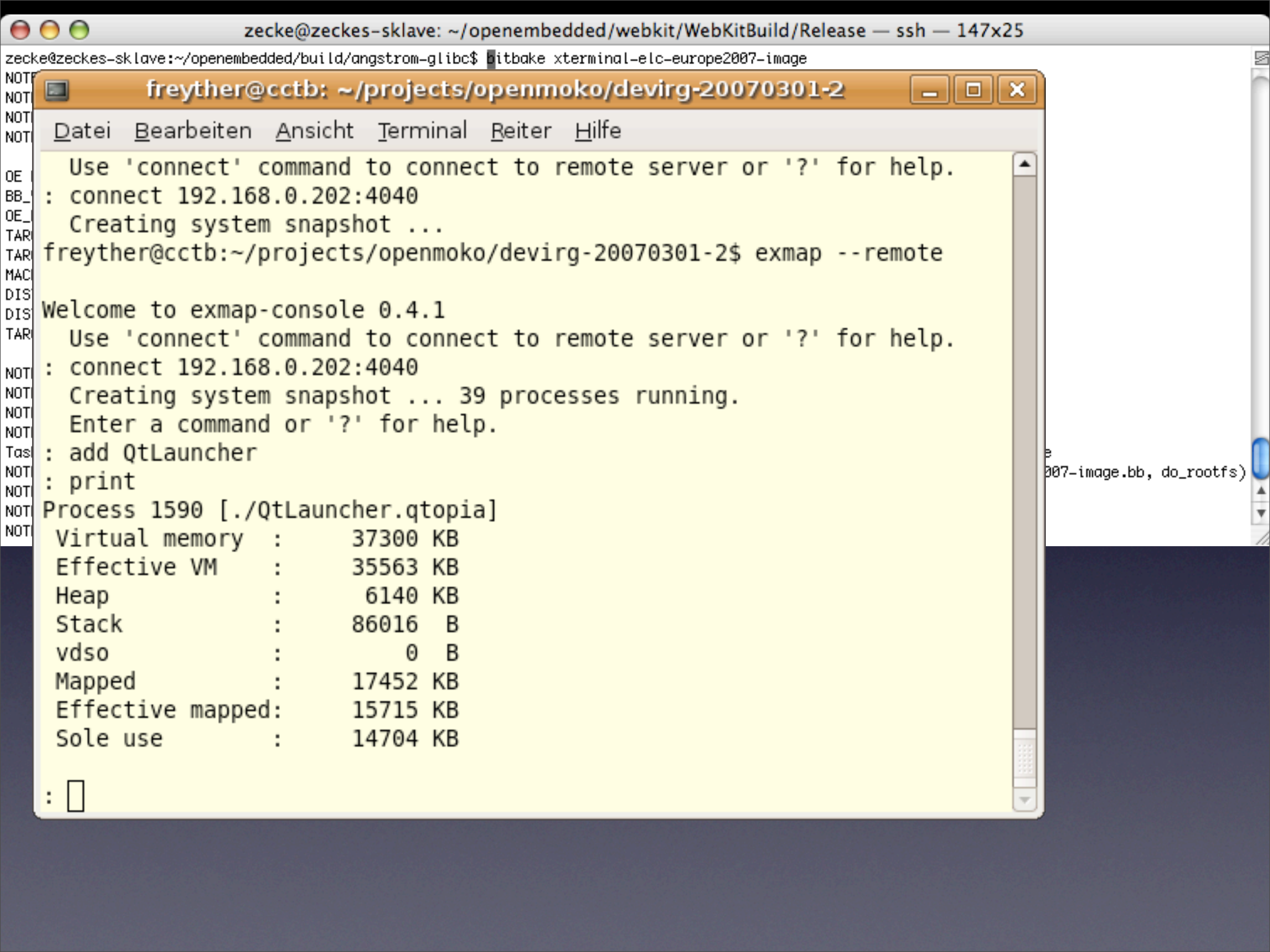
Selecting machine and applications

- Uses GtkLauncher, QtLauncher and Minimo
- MACHINE="fic-gta01",
DISTRO="angstrom-2007.1"
- bitbake xterminal-elc-europe2007-image
- using exmap-console and xrestop to measure


```
zecke@zeckes-sklave: ~/openembedded/webkit/WebKitBuild/Release — ssh — 147x25
zecke@zeckes-sklave:~/openembedded/build/angstrom-glibc$ bitbake xterminal-elc-europe2007-image
NOTE: Psyco JIT Compiler (http://psyco.sf.net) not available. Install it to increase performance.
NOTE: Handling BitBake files: \ (4797/4797) [100 %]
NOTE: Parsing finished. 4564 cached, 0 parsed, 233 skipped, 0 masked.
NOTE: build 200710311821: started

OE Build Configuration:
BB_VERSION      = "1.8.9"
OE_REVISION     = "1d191d57e609530bf7d6ccd6705f7e63b0c24231"
TARGET_ARCH    = "arm"
TARGET_OS      = "linux-gnueabi"
MACHINE        = "fic-gta01"
DISTRO         = "angstrom"
DISTRO_VERSION = "2007.9-test-20071031"
TARGET_FPU     = "soft"

NOTE: Resolving missing task queue dependencies
NOTE: preferred version 2.5 of glibc not available (for item virtual/arm-angstrom-linux-gnueabi-libc-for-gcc)
NOTE: Preparing runqueue
NOTE: Executing runqueue
Task1 2388 Task 4 /home/zecke/openembedded/org.openembedded.dev/packages/images/xterminal-elc-europe2007-image.bb False True
NOTE: Running task 2390 of 2391 (ID: 4, /home/zecke/openembedded/org.openembedded.dev/packages/images/xterminal-elc-europe2007-image.bb, do_rootfs)
NOTE: package xterminal-elc-europe2007-image-1.0: started
NOTE: package xterminal-elc-europe2007-image-1.0-r0: task do_rootfs: started
NOTE: package xterminal-elc-europe2007-image-1.0-r0: task do_rootfs: completed
```

zecke@zeckes-sklave:~/openembedded/build/angstrom-glibc\$ bitbake xterminal-elc-europe2007-image

freyther@cctb: ~/projects/openmoko/devirg-20070301-2

Datei Bearbeiten Ansicht Terminal Reiter Hilfe

Use 'connect' command to connect to remote server or '?' for help.

: connect 192.168.0.202:4040

Creating system snapshot ...

freyther@cctb:~/projects/openmoko/devirg-20070301-2\$ exmap --remote

Welcome to exmap-console 0.4.1

Use 'connect' command to connect to remote server or '?' for help.

: connect 192.168.0.202:4040

Creating system snapshot ... 39 processes running.

Enter a command or '?' for help.

: add QtLauncher

: print

Process 1590 [./QtLauncher.qtopia]

Virtual memory : 37300 KB

Effective VM : 35563 KB

Heap : 6140 KB

Stack : 86016 B

vdso : 0 B

Mapped : 17452 KB

Effective mapped: 15715 KB

Sole use : 14704 KB

: □

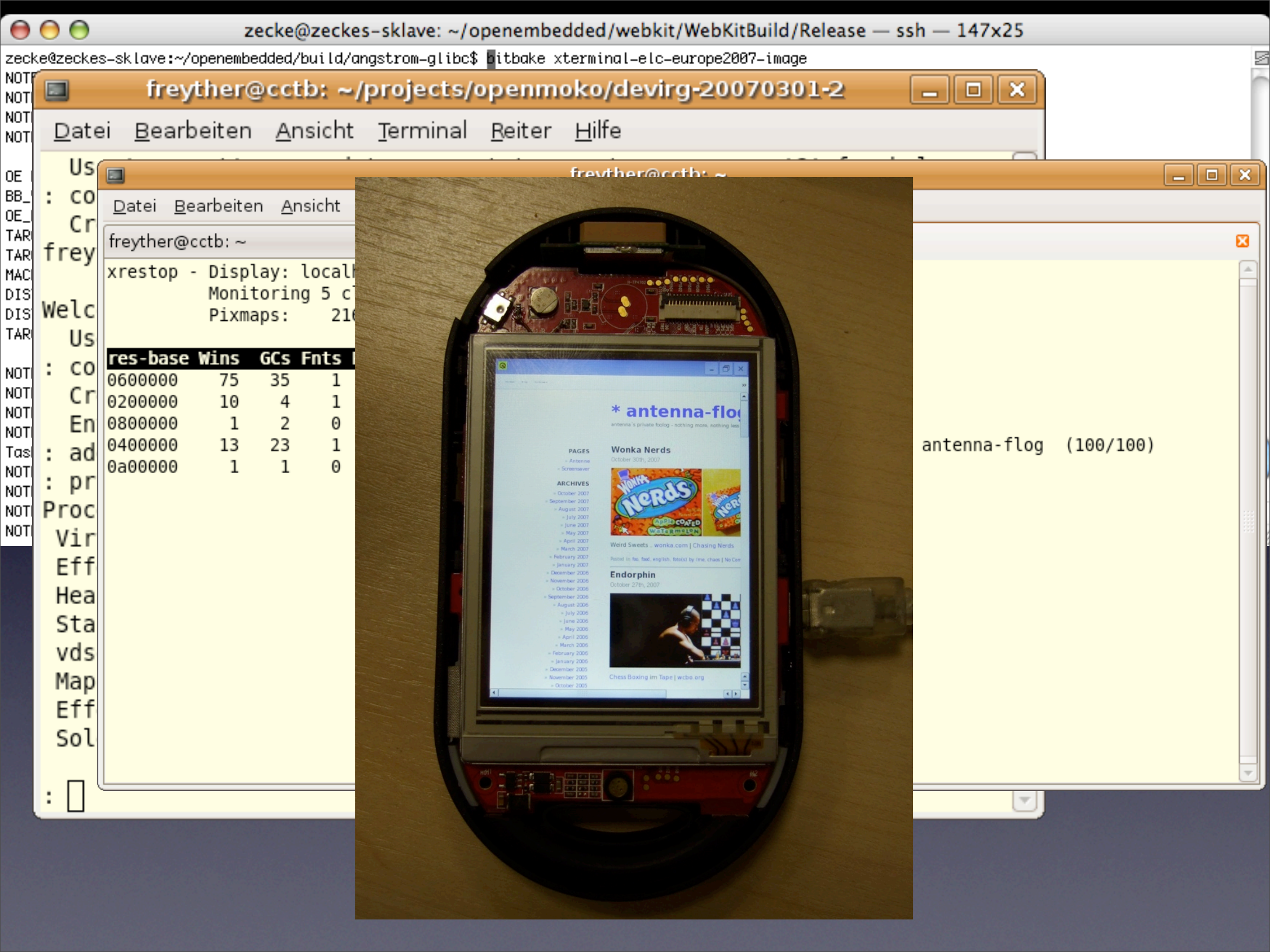

```
xrestop - Display: localhost:0
```

```
Monitoring 5 clients. XErrors: 0
```

Pixmaps: 2167K total, Other: 9K total, All: 2177K total

res-base	Wins	GCs	Fnts	Pxms	Misc	Pxm	mem	Other	Total	PID	Identifier
----------	------	-----	------	------	------	-----	-----	-------	-------	-----	------------

0600000	75	35	1	56	39	1939K	4K	1943K	1607	Minimo
0200000	10	4	1	0	55	125K	2K	127K	?	matchbox
0800000	1	2	0	1	6	103K	216B	103K	?	Keyboard
0400000	13	23	1	9	32	7B	2K	2K	1604	GtkLauncher * antenna-flog (100/100)
0a00000	1	1	0	0	0	0B	48B	48B	?	xrestop



zecke@zeckes-skylave: ~/openembedded/webkit/WebKitBuild/Release — ssh — 147x25

zecke@zeckes-skylave:~/openembedded/build/angstrom-glibc\$ bitbake xterminal-elm-europe2007-image

freyther@cctb: ~/projects/openmoko/devirg-20070301-2

Datei Bearbeiten Ansicht Terminal Reiter Hilfe

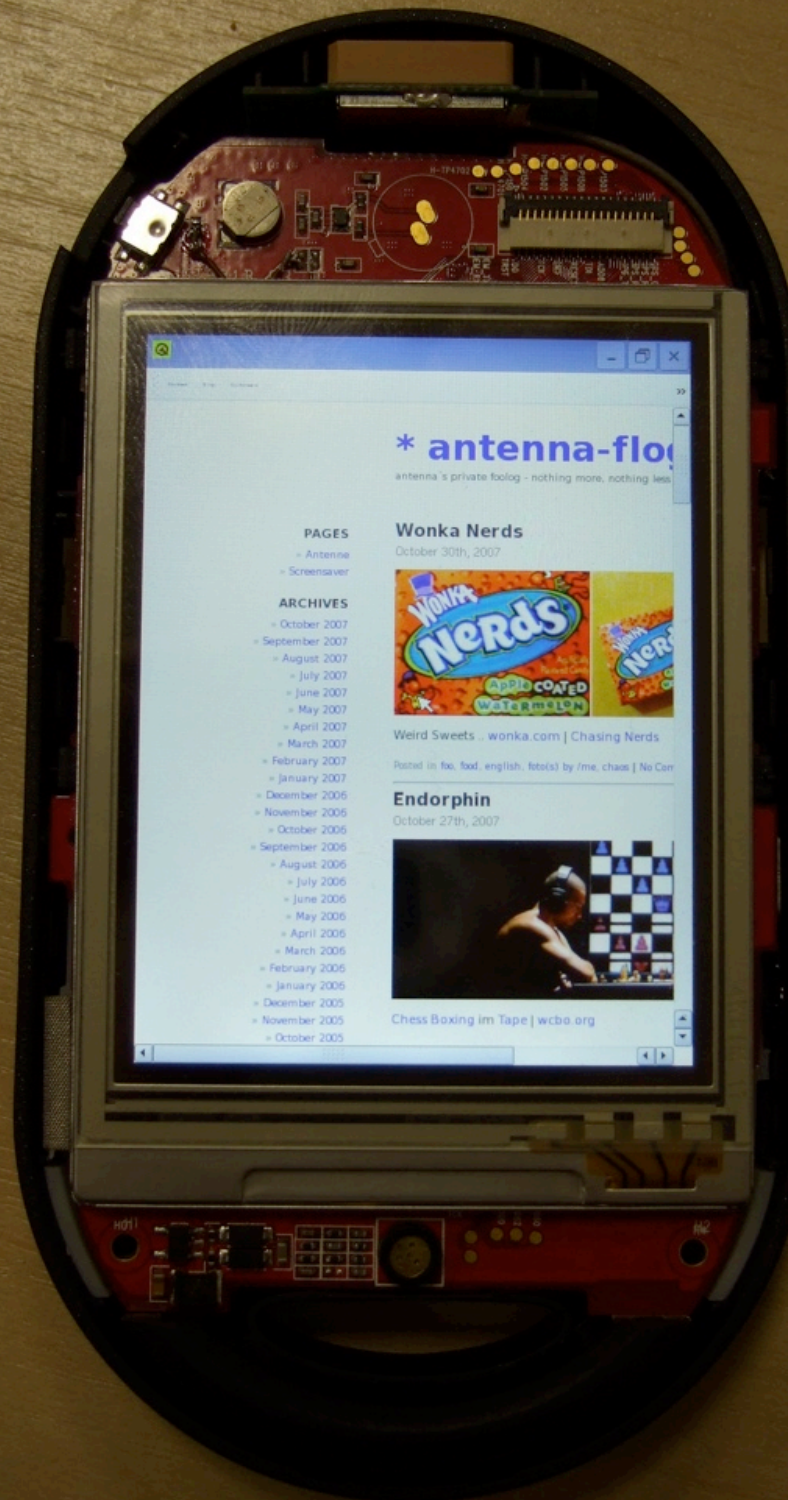
freyther@cctb: ~

Datei Bearbeiten Ansicht

freyther@cctb: ~

xrestop - Display: localh
Monitoring 5 c
Pixmaps: 210

res-base	Wins	GCs	Fnts
06000000	75	35	1
02000000	10	4	1
08000000	1	2	0
04000000	13	23	1
0a000000	1	1	0



antenna-flog (100/100)

Installed Size

What is your weight

Browser	Number of Libraries (direct)	Number of Libraries (indirect)	Installed Size (library/binary)
WebKit/Qt	22	31	11 MB + Qt
WebKit/Qtopia	9	11	15 MB
WebKit/Gtk+	30	52	11 MB + deps
Mozilla	29	53	12 MB + deps

Opening about:blank

Browser	Exmap information			XII resources
	VM	Heap	Mapped	
WebKit/Qt	31 MB	2 MB	15 MB	195 KB
WebKit/Qtopia	21 MB	720 KB	9 MB	0 B
WebKit/Gtk+	56 MB	2 MB	13 MB	2 B
Mozilla	69 MB	5 MB	17 MB	27 KB

Opening a Foto Log

Browser	Exmap information			XII resources
	VM	Heap	Mapped	
WebKit/Qt	50 MB	10 MB	25 MB	423 KB (+ 228 KB)
WebKit/Qtopia	37 MB	6 MB	16 MB	0 B
WebKit/Gtk+	59 MB	4 MB	18 MB	5 B (+3 B)
Mozilla	100 MB	9 MB	23 MB	1941 KB (+1918 KB)

Interpretation

- Mozilla uses the most memory
- Mozilla uploads the most to the X-Server
- WebKit/Gtk+ is doing client side rendering
- WebKit/Qt is doing well too, specially on QtopiaCore.

Shrinking it

An exercise using QtopiaCore

- Build a stripped down version of Qt/QtopiaCore
- Only enough features to compile WebKit/Qt
- Remove SVG, XML, XPath, SQLite from WebKit
- Play with more gcc options
- First attempt was statically linking and the result was one 15 MB binary.

Conclusion

What did we see and learn

- exmap, xrestop and OpenEmbedded
- WebKit is an interesting option for building browsers or embedding web content
- It is the engine performing the best
- Apple, Nokia, Trolltech use it commercially
- Qt4.4 will feature the first stable release of WebKit for Linux

<http://www.openembedded.org/~zecke/elce2007>

Questions?

<http://www.openembedded.org/~zecke/elce2007>

